

We claim:

1. An apparatus for removing an organic material from a semiconductor device, comprising:

a reactor for receiving at least one semiconductor device with deposited organic material and receiving a fluid having ingredients for removing the organic material from the semiconductor device;

an optical sensor system for transmitting an emitted optical radiation through the fluid and receiving a transmitted optical radiation transmitted through the fluid;

a control device for processing information about optical radiation intensity and for controlling an insertion of at least one of the ingredients into the fluid, said control device connected to said optical sensor system; and

a de-gasifying device for removing bubbles from the fluid.

2. The apparatus according to claim 1, further comprising a radiation source for emitting said emitted optical radiation, said emitted optical radiation having a single wavelength.

3. The apparatus according to claim 2, wherein said radiation source includes a laser device or a light emitting diode.

4. The apparatus according to claim 1, further comprising an optical cable for connecting said optical sensor system to the control device.

5. The apparatus according to claim 4, wherein said optical cable has a first optical fiber for transmitting said emitted optical radiation and a second optical fiber for transmitting said received optical radiation.

6. The apparatus according to claim 1, further comprising a fluid pipe system for inserting the fluid into said reactor and for removing the fluid from said reactor, said optical sensor system integrated into said fluid pipe system.

7. The apparatus according to claim 6, wherein said fluid pipe system has at least one filter for extracting particles.

8. The apparatus according to claim 6, wherein said fluid pipe system has a heater for heating the fluid.

9. The apparatus according to claim 8, wherein said heater and said optical sensor system are disposed relative to each other in such a manner that a fluid stream of the fluid

through said fluid pipe system passes said heater and then said optical sensor system .

10. A method for removing an organic material from a semiconductor device, which comprises the steps:

providing a reactor;

inserting at least one semiconductor device with deposited organic material into the reactor;

inserting fluid ingredients for removing the organic material from the semiconductor device into a fluid;

transmitting an emitted optical radiation towards the fluid;

receiving transmitted optical radiation transmitted through the fluid;

detecting an optical radiation intensity not influenced by process induced bubbles; and

controlling the insertion of at least one of the ingredients in dependence on the detected optical radiation intensity.

11. The method according to claim 10, which further comprises the steps of modulating the emitted optical radiation and demodulating the transmitted optical radiation.

12. The method according to claims 10, which further comprises the step of detecting maximum values of the optical radiation intensity.

13. The method according to claim 10, which further comprises the step of inserting sulphuric acid and hydrogen peroxide into the fluid.

14. The method according to claim 13, which further comprises the step of controlling the insertion of hydrogen peroxide.

15. The method according to claim 10, which further comprises the step of monitoring the optical radiation intensity over a defined time period.

16. The method according to claim 10, wherein the step of transmitting an emitted optical radiation towards the fluid is carried out by transmitting a blue light towards the fluid.

17. The method according to claim 10, which further comprises the step of comparing the detected optical radiation intensity with an initial radiation intensity

detected before the semiconductor device is inserted into the reactor.

18. The method according to claim 10, which further comprises the steps of comparing a detected value of the optical radiation intensity with values of a pre-defined table on defined time stamps, and controlling the amount of one of the fluid ingredients to be inserted into the fluid in dependence on the comparison.

19. The method according to claims 10, which further comprises the step of detecting a minimum value of a measured optical radiation intensity curve.

20. The method according to claim 10, which further comprises carrying out the step of inserting at least one semiconductor device with deposited organic material into the reactor by inserting at least one semiconductor device with photoresist material, and carrying out the step of inserting fluid ingredients for removing the organic material from the semiconductor device by inserting fluid ingredients for removing the photoresist material from the semiconductor device.

21. An apparatus for removing an organic material from a semiconductor device, comprising:

a reactor for receiving at least one semiconductor device with deposited organic material and for receiving a fluid having ingredients for removing the organic material from the semiconductor device;

an optical sensor system for receiving a transmitted optical radiation transmitted through the fluid, said transmitted optical radiation having an optical radiation intensity; and

a control device connected to said optical sensor system for processing information about said optical radiation intensity of said transmitted optical radiation, said control device controlling an insertion of at least one of the ingredients into the fluid depending on said optical radiation intensity of said transmitted optical radiation.